

=> fil reg.

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STRUCTURE FILE UPDATES: 10 FEB 2002 HIGHEST RN 391197-12-9
 DICTIONARY FILE UPDATES: 10 FEB 2002 HIGHEST RN 391197-12-9

TSCA INFORMATION NOW CURRENT THROUGH July 7, 2001

Please note that search-term pricing does apply when
 conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Calculated physical property data is now available. See HELP PROPERTIES
 for more information. See STNote 27, Searching Properties in the CAS
 Registry File, for complete details:

<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

The P indicator for Preparations was not generated for all of the
 CAS Registry Numbers that were added to the H/Z/CA/CAplus files between
 12/27/01 and 1/23/02. Use of the P indicator in online and SDI searches
 during this period, either directly appended to a CAS Registry Number
 or by qualifying an L-number with /P, may have yielded incomplete results.
 As of 1/23/02, the situation has been resolved. Also, note that searches
 conducted using the PREP role indicator were not affected.

Customers running searches and/or SDIs in the H/Z/CA/CAplus files
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 and 1/23/02, are encouraged to re-run these strategies. Contact the
 CAS Help Desk at 1-800-848-6533 in North America or 1-614-447-3698,
 worldwide, or send an e-mail to help@cas.org for further assistance or to
 receive a credit for any duplicate searches.

=> d ide can l1

L1 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2002 ACS

RN 7439-95-4 REGISTRY

CN Magnesium (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN JIS 1

CN Magnesium element

CN PK 31

CN PK 31 (magnesium)

CN Rieke's active magnesium

DR 14147-08-1, 67208-78-0, 199281-20-4, 298688-48-9

MF Mg

CI COM

LC STN Files: ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CABA, CANCERLIT,
 CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN,
 CSCHEM, CSNB, DDFU, DETHERM*, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2,
 ENCOMPAT, ENCOMPAT2, HSDB*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE,
 MRCK*, MSDS-OHS, NAPRALERT, NIOSHTIC, TOXCENTER, TOXLIT, ULIDAT, USPAT2,
 USPATFULL, VETU, VTB

(*File contains numerically searchable property data)

Other Sources: DSL**, EINECS**, TSCA**

(**Enter CHEMLIST File for up-to-date regulatory information)

Mg

149297 REFERENCES IN FILE CA (1967 TO DATE)

5844 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

149428 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 136:111823
 REFERENCE 2: 136:111815
 REFERENCE 3: 136:111798
 REFERENCE 4: 136:111791
 REFERENCE 5: 136:111768
 REFERENCE 6: 136:111766
 REFERENCE 7: 136:111759
 REFERENCE 8: 136:111263
 REFERENCE 9: 136:111062
 REFERENCE 10: 136:111025

=> d ide can l2

L2 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2002 ACS

RN 7786-30-3 REGISTRY

CN Magnesium chloride (MgCl₂) (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN **Magnesium chloride (6CI, 7CI, 8CI)**

OTHER NAMES:

CN Aerotex Accelerator MX

CN Catalyst G

CN Magnesium dichloride

CN Magnogene

CN TMT 2

DR 12285-34-6, 77069-22-8

MF Cl₂ Mg

CI COM

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO,
 CA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,
 CHEMINFORMRX, CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DETHERM*, DIOGENES,
 DRUG, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2, GMELIN*,
 HSDB*, IFICDB, IFIPAT, IFIUDB, MEDLINE, MRCK*, MSDS-OHS, NIOSHTIC,
 PDLCOM*, PHAR, PIRA, PROMT, RTECS*, TOXCENTER, TOXLIT, TULSA, USAN,
 USPAT2, USPATFULL, VETU, VTB

(*File contains numerically searchable property data)

Other Sources: DSL**, EINECS**, TSCA**

(**Enter CHEMLIST File for up-to-date regulatory information)

Cl-Mg-Cl

20861 REFERENCES IN FILE CA (1967 TO DATE)

504 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

20880 REFERENCES IN FILE CAPLUS (1967 TO DATE)

13 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 136:111828
 REFERENCE 2: 136:111556
 REFERENCE 3: 136:109302
 REFERENCE 4: 136:109078

REFERENCE 5: 136:107514
 REFERENCE 6: 136:107453
 REFERENCE 7: 136:106236
 REFERENCE 8: 136:105413
 REFERENCE 9: 136:104876
 REFERENCE 10: 136:104608

=> d his

(FILE 'HOME' ENTERED AT 16:22:44 ON 11 FEB 2002)
 SET COST OFF

FILE 'REGISTRY' ENTERED AT 16:22:56 ON 11 FEB 2002
 E MAGNESIUM/CN

L1 1 S E3
 E MAGNESIUM CHLORIDE/CN
 L2 1 S E3

FILE 'HCAPLUS' ENTERED AT 16:23:32 ON 11 FEB 2002
 E ACTIN/CT

E E3+ALL
 L3 1 S E1
 E E2+ALL
 L4 19413 S E2
 L5 1133 S E2 (L) G
 L6 1134 S L3,L5
 L7 4805 S ACTIN (L) G
 L8 4805 S L6,L7
 L9 36371 S ACTIN
 L10 168657 S L1 OR L2
 L11 47463 S MAGNESIUM CHLORIDE OR MGCL2 OR MAGNESIU
 L12 895 S L3-L9 AND L10,L11
 L13 36 S L12 AND ?CRYS?
 L14 130 S L3-L9 AND (PARACRYS? OR PARA(L)?CRYS?)
 L15 24 S L14 AND L10,L11
 L16 36 S L13,L15
 L17 125 S ACTINS/CW (L) PREP/RL
 L18 1 S L16 AND L17
 E HARTMAN J/AU
 L19 22 S E3,E11
 E HARTMAN JAMES/AU
 L20 9 S E3,E8,E9
 E MALIK F/AU
 L21 193 S E3-E12
 E SAKOZIC R/AU
 E SAKOWIC R/AU
 L22 23 S E10,E12
 E FINER J/AU
 L23 16 S E3,E6,E9,E10
 L24 7 S L3-L9,L17 AND L19-L23
 L25 13 S L16 AND (FORMATION OR ISOLATION OR CHARACTERIZATION OR POLYMO
 L26 12 S L25 NOT ASCARIS/TI
 L27 13 S L18,L26
 L28 12 S L27 AND (MAGNESIUM OR MGCL2 OR MG###)
 L29 19 S L24,L28 AND L1-L28
 L30 1 S L29 AND L17
 L31 18 S L29 NOT L30

FILE 'REGISTRY' ENTERED AT 16:44:38 ON 11 FEB 2002

=> fil hcaplus

FILE 'HCAPLUS' ENTERED AT 16:44:50 ON 11 FEB 2002

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FILE COVERS 1907 - 8 Feb 2002 VOL 136 ISS 7

FILE LAST UPDATED: 30 Jan 2002 (20020130/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

CAS roles have been modified effective December 16, 2001. Please check your SDI profiles to see if they need to be revised. For information on CAS roles, enter HELP ROLES at an arrow prompt or use the CAS Roles thesaurus (/RL field) in this file.

The P indicator for Preparations was not generated for all of the CAS Registry Numbers that were added to the CAS files between 12/27/01 and 1/23/02. As of 1/23/02, the situation has been resolved. Searches and/or SDIs in the H/Z/CA/CAplus files incorporating CAS Registry Numbers with the P indicator executed between 12/27/01 and 1/23/02 may be incomplete. See the NEWS message on this topic for more information.

=> d l31 all hitstr tot

L31 ANSWER 1 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1999:5376 HCAPLUS

DN 130:220029

TI Use of optical traps in single-molecule study of nonprocessive biological motors

AU Mehta, A. D.; **Finer, J. T.**; Spudich, J. A.

CS Department of Biochemistry, Stanford University School of Medicine, Stanford, CA, 94305, USA

SO Methods Enzymol. (1998), 298(Molecular Motors and the Cytoskeleton, Part B), 436-459

CODEN: MENZAU; ISSN: 0076-6879

PB Academic Press

DT Journal

LA English

CC 9-5 (Biochemical Methods)

AB The authors describe the single-mol. measurements, using the gliding assay as the point of departure. The authors first discussed prepn. of proteins, coverslips, and labeled polystyrene beads for use in optical trapping. Then they provide a sketch of instrument design. Finally, they focus on exptl. conditions and data anal. The problems in identifying single-mol. binding events and methods developed to overcome them are also reviewed. (c) 1998 Academic Press.

ST optical trap single mol study biol motor

IT Filaments

Muscle

Optical traps

(use of optical traps in single-mol. study of nonprocessive biol. motors)

IT **Actins**

Proteins (general), biological studies

RL: BSU (Biological study, unclassified); BIOL (Biological study)
 (use of optical traps in single-mol. study of nonprocessive biol.
 motors)

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Dupuis, D; J Muscle Res Cell Motil 1997, V18, P17 MEDLINE
- (2) Finer, J; Biophys J 1995, V68, P291s HCAPLUS
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- (5) Harada, Y; Cell Motil Cytoskelet 1988, V10, P71 HCAPLUS
- (6) Harada, Y; J Molec Biol 1990, V216, P49 HCAPLUS
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- (8) Ishijima, A; Biochem Biophys Res Commun 1994, V199, P1057 HCAPLUS
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- (11) Kron, S; Methods Enzymol 1991, V196, P399 HCAPLUS
- (12) Kron, S; Proc Natl Acad Sci USA 1986, V83, P6272 HCAPLUS
- (13) Mehta, A; Methods Cell Biol 1998, V55, P47 MEDLINE
- (14) Mehta, A; NATO ASI Series H: Cell Biol 1997, V102, P247 HCAPLUS
- (15) Mehta, A; Proc Natl Acad Sci USA 1997, V94, P7927 HCAPLUS
- (16) Molloy, J; Biophys J 1995, V68, P298s HCAPLUS
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- (19) Nishizaka, T; Nature 1995, V377, P251 HCAPLUS
- (20) Reif, M; Science 1997, V276, P1109
- (21) Schnitzer, M; Nature 1997, V388, P386 HCAPLUS
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- (26) Tskhovrebova, L; Nature 1997, V387, P308 HCAPLUS
- (27) Visscher, K; IEEE J Select Topics Quantum Electron 1996, V2, P1066 HCAPLUS
- (28) Yanagida, T; Nature 1985, V316, P366 HCAPLUS
- (29) Yin, H; Science 1995, V270, P1653 HCAPLUS

L31 ANSWER 2 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1998:288612 HCAPLUS

DN 129:91799

TI A six-module human nebulin fragment bundles **actin**
 filaments and induces **actin** polymerization

AU Gonsior, Sabine M.; Gautel, Mathias; Hinssen, Horst

CS Biochemical Cell Biology Group, University of Bielefeld, Bielefeld, 33615,
 Germany

SO J. Muscle Res. Cell Motil. (1998), 19(3), 225-235

CODEN: JMRMD3; ISSN: 0142-4319

PB Chapman & Hall

DT Journal

LA English

CC 6-1 (General Biochemistry)

AB The authors have investigated the interaction of a 6-repeat recombinant human nebulin fragment (S6R2R7) with F-**actin**, with **Mg2** +-induced **actin paracrystals**, and G-**actin**, resp. This fragment corresponds to super-repeat 6, repeat 2 to 7 of human nebulin, and is located in the N-terminal part of the super-repeat region of the nebulin mol. The S6R2R7 fragment included an immuno-tag of three amino-acid residues (EEF) at one end which was detectable by a monoclonal anti-tubulin YL1/2. By a cosedimentation assay, interaction between F-**actin** and S6R2R7 was obsd. Electron microscopy revealed the formation of large bundle-like aggregates contg. highly parallelized **actin** filaments, apparently caused by **actin** bundling of the nebulin fragment. Compared with **Mg2** +-induced **actin paracrystals** where the helixes of the **actin** filaments are arranged in register, the filaments in the **actin-nebulin** bundles seem to be packed in a different way and

show no obvious periodicity. The bundles were also visible in the light microscope, and immunofluorescence microscopy revealed binding of the nebulin fragment S6R2R7 to both preformed **Mg2+** **paracrystals** and to **F-actin**. The authors also analyzed the effect of S6R2R7 on **actin** under non-polymerization conditions by cosedimentation assays and pyrene **actin** fluorimetry, as well as fluorescence microscopy and electron microscopy. Nebulin-induced **actin** polymerization was observed with an enhancement of the nucleation step indicating a stabilization of **actin** nuclei by S6R2R7. Light and electron microscopy revealed bundle-like **actin**-nebulin aggregates similar to those formed by pre-assembled **F-actin** and S6R2R7. Thus, even in the absence of salt, S6R2R7 promotes **actin** polymerization and induces formation of tightly packed **actin** filament bundles. It was assumed that the **actin** filaments are crosslinked by the nebulin fragments, indicating a rather low cooperativity of binding to a single filament.

ST nebulin fragment **actin** filament bundling; **actin** polymerization
nebulin fragment

IT **Quasicrystals**

(**Mg2+**-induced **actin** **paracrystals**;
six-module human nebulin fragment bundles **actin** filaments and
induces **actin** polymerization.)

IT **Actin** filament

Polymerization

(six-module human nebulin fragment bundles **actin** filaments
and induces **actin** polymerization.)

IT **F-actins**

G-actins

Nebulin

RL: BPR (Biological process); BIOL (Biological study); PROC (Process)

(six-module human nebulin fragment bundles **actin** filaments
and induces **actin** polymerization.)

IT **7439-95-4, Magnesium**, biological studies

RL: BAC (Biological activity or effector, except adverse); BIOL
(Biological study)

(**Mg2+**-induced **actin** **paracrystals**;
six-module human nebulin fragment bundles **actin** filaments and
induces **actin** polymerization.)

IT **7439-95-4, Magnesium**, biological studies

RL: BAC (Biological activity or effector, except adverse); BIOL
(Biological study)

(**Mg2+**-induced **actin** **paracrystals**;
six-module human nebulin fragment bundles **actin** filaments and
induces **actin** polymerization.)

RN 7439-95-4 HCAPLUS

CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 3 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1997:479465 HCAPLUS

DN 127:187682

TI Detection of single-molecule interactions using correlated thermal
diffusion

AU Mehta, A. D.; **Finer**, J. T.; Spudich, J. A.

CS Departments Biochemistry Developmental Biology, Beckman Center, Stanford
University School Medicine, Stanford, CA, 94305, USA

SO Proc. Natl. Acad. Sci. U. S. A. (1997), 94(15), 7927-7931

CODEN: PNASA6; ISSN: 0027-8424

PB National Academy of Sciences

DT Journal

LA English

CC 9-5 (Biochemical Methods)

- AB Observation of discrete, single-mol. binding events allows one to bypass assumptions required to infer single-mol. properties from studies of ensembles of mols. Optically trapped beads and glass microneedles have been applied to detect single-mol. binding events, but it remains difficult to identify signs of binding events given the large displacements induced by thermal forces. Here, we exploit thermal diffusion by using correlation between motion of optically trapped beads attached to both ends of a single **actin** filament to track binding events of individual myosin mols. We use correlated diffusion to measure the stiffness of a single myosin mol. and est. its thermal fluctuation in a poststroke state as comparable in amplitude to the measured stroke distance. The use of correlated diffusion to measure kinetics of single-mol. interactions and the stiffness of the interacting moieties should be applicable to any pair of interacting mols., and not limited to biol. motors.
- ST thermal diffusion binding mol detection; myosin binding **actin**
bead movement detection
- IT **Actins**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(beads attached to; detection of myosin binding to single filament **actin** by movement of micrometer sized beads)
- IT Thermal diffusion
(detection of single-mol. interactions using correlated thermal diffusion)
- IT **Myosins**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(detection of single-mol. interactions using correlated thermal diffusion)
- L31 ANSWER 4 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:179980 HCAPLUS
DN 124:223983
TI Single myosin molecule mechanics (muscle contraction, **actin** filament)
AU **Finer, Jeffrey Todd**
CS Stanford Univ., Stanford, CA, USA
SO (1996) 234 pp. Avail.: Univ. Microfilms Int., Order No. DA9602876
From: Diss. Abstr. Int., B 1996, 56(10), 5468
DT Dissertation
LA English
CC 6-1 (General Biochemistry)
AB Unavailable
ST myosin mechanics muscle contraction **actin** filament
IT Muscle
(contraction; single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
- IT **Myosins**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
- IT **Actins**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(F-, single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
- IT Microfilament
(thin filament, single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
- L31 ANSWER 5 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:467785 HCAPLUS
DN 122:259108
TI Characterization of single **actin**-myosin interactions
AU **Finer, Jeffrey T.**; Mehta, Amit D.; Spudich, James A.
CS Dep. Biochem. Dev. Biol., Stanford Univ. Med. Cent., Stanford, CA, 94305, USA
SO Biophys. J. (1995), 68(4, Suppl.), 291s-7s

CODEN: BIOJAU; ISSN: 0006-3495

DT Journal
 LA English
 CC 6-3 (General Biochemistry)
 AB The feedback-enhanced laser trap assay (Finer et al., 1994) allows the measurement of force and displacement produced by single myosin mols. interacting with an **actin** filament suspended in soln. by two laser traps. The av. displacement of 11 nm at low load and the av. force of 4 pN near isometric conditions are consistent with the conventional swinging cross-bridge model of muscle contraction (Huxley, 1969). The durations of single **actin**-myosin interactions at low load, 3-7 ms, suggest a relatively small duty ratio. Event durations can be increased either by reducing the ATP concn. until ATP binding is rate-limiting or by lowering the temp. For sufficiently long interactions near isometric conditions, low frequency force fluctuations were obsd. within the time frame of a single event. Single myosin events can be measured at ionic strengths that disrupt weak binding actomyosin interactions, supporting the postulate of distinct weak and strong binding states. Myosin-generated force and displacement were measured simultaneously against several different loads to generate a force-displacement curve. The linear appearance of this curve suggests that the myosin powerstroke is driven by the release of a strained linear elastic element with a stiffness of approx. 0.4 pN nm⁻¹.

ST **actin** myosin interaction
 IT Molecular association
 (single **actin**-myosin interactions)

IT **Actins**
 Myosins
 RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
 (single **actin**-myosin interactions)

IT 56-65-5, 5'-Atp, biological studies
 RL: BAC (Biological activity or effector, except adverse); BIOL
 (Biological study)
 (single **actin**-myosin interactions in presence of)

L31 ANSWER 6 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1994:453307 HCAPLUS
 DN 121:53307
 TI Single myosin molecule mechanics: piconewton forces and nanometer steps
 AU **Finer, Jeffrey T.**; Simmons, Robert M.; Spudich, James A.
 CS Sch. Med., Stanford Univ., Stanford, CA, 94305, USA
 SO Nature (London) (1994), 368(6467), 113-19
 CODEN: NATUAS; ISSN: 0028-0836

DT Journal
 LA English
 CC 9-5 (Biochemical Methods)
 Section cross-reference(s): 13

AB A new in vitro assay using a feedback enhanced laser trap system allows direct measurement of force and displacement that results from the interaction of a single myosin mol. with a single suspended **actin** filament. Discrete stepwise movements averaging 11 nm were seen under conditions of low load, and single force transients averaging 3-4 pN were measured under isometric conditions. The magnitudes of the single forces and displacements are consistent with predictions of the conventional swinging-crossbridge model of muscle contraction.

ST myosin mechanics **actin** filament method; muscle contraction
 myosin mechanics **actin** method
 IT Muscle
 (contraction of, myosin single mol. movement and forces on
 actin filament anal. by, optical trap method in relation to)

IT **Actins**
 RL: ANST (Analytical study)
 (filament, myosin single mol. movement and forces on, optical trap
 method for detn. of)

IT Force
 (in myosin single mol. on **actin** filament, optical trap method)

- for anal. of)
- IT Myosins
RL: ANST (Analytical study)
(mechanics of single mol. of, on **actin** filament, optical trap method for detn. of movement and forces in)
- IT Microfilament
(thin filament, **actin**, myosin single mol. movement and forces on, optical trap method for detn. of)
- L31 ANSWER 7 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:100841 HCAPLUS
DN 120:100841
TI In vitro methods for measuring force and velocity of the **actin**-myosin interaction using purified proteins
AU Warrick, Hans M.; Simmons, Robert M.; **Finer, Jeffrey T.**; Uyeda, Taro Q. P.; Chu, Steven; Spudich, James A.
CS Sch. Med., Stanford Univ., Stanford, CA, 94305, USA
SO Methods Cell Biol. (1993), 39(Motility Assays for Motor Proteins), 1-21
CODEN: MCBLAG; ISSN: 0091-679X
DT Journal; General Review
LA English
CC 9-0 (Biochemical Methods)
Section cross-reference(s): 6, 13
AB A review with many refs. Prepn. of in vitro motility assay components, in vitro assay for myosin velocity and for myosin force in the motility assay, components of the optical trap system, and future directions related to the title method are included.
ST **actin** myosin interaction review
IT Myosins
RL: ANST (Analytical study)
(interactions of, with **actins**, force and velocity measurement of)
- IT **Actins**
RL: ANST (Analytical study)
(interactions of, with myosins, force and velocity measurement of)
- L31 ANSWER 8 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:138654 HCAPLUS
DN 114:138654
TI Nucleotide specificity of the enzymic and motile activities of dynein, kinesin, and heavy meromyosin
AU Shimizu, Takashi; Furusawa, Kiyotaka; Ohashi, Shinichi; Toyoshima, Yoko Y.; Okuno, Makoto; **Malik, Fady**; Vale, Ronald D.
CS Res. Inst. Polym. Text., Tsukuba, 305, Japan
SO J. Cell Biol. (1991), 112(6), 1189-97
CODEN: JCLBA3; ISSN: 0021-9525
DT Journal
LA English
CC 7-3 (Enzymes)
Section cross-reference(s): 6
AB The substrate specificities of dynein, kinesin, and myosin substrate turnover activity and cytoskeletal filament-driven translocation were examd. using 15 ATP analogs. The dyneins were more selective in their substrate utilization than bovine brain kinesin or muscle heavy meromyosin, and even different types of dyneins, such as 14 S and 22 S dynein from Tetrahymena cilia and the .beta.-heavy chain-contg. particle from the outer-arm dynein of sea urchin flagella, could be distinguished by their substrate specificities. Although bovine brain kinesin and muscle heavy meromyosin both exhibited broad substrate specificities, kinesin-induced microtubule translocation varied over a 50-fold range in speed among the various substrates, whereas heavy meromyosin-induced **actin** translocation varied only by 4-fold. With both kinesin and heavy meromyosin, the relative velocities of filament translocation did not correlate well with the relative filament-activated substrate turnover rates. Furthermore, some ATP analogs that did not support the filament translocation exhibited filament-activated substrate turnover rates.

Filament-activated substrate turnover and power prodn., therefore, appear to become uncoupled with certain substrates. In conclusion, the substrate specificities and coupling to motility are distinct for different types of mol. motor proteins. Such nucleotide fingerprints of enzymic activities of motor proteins may prove useful as a tool for identifying what type of motor is involved in powering a motility-related event that can be reconstituted in vitro.

ST cytoskeleton filament motility ATPase ATP analog; dynein motility ATPase ATP analog; kinesin motility ATPase ATP analog; meromyosin motility ATPase ATP analog

IT Cilia
(motility of, ATP analogs specificity of, ATPase specificity in relation to)

IT Michaelis constant
(of ATPase, of microtubule-dynein system)

IT Microtubule
(translocation of, in system with dyneins, ATP analog specificity of, ATPase specificity in relation to)

IT Dyneins
RL: BIOL (Biological study)
(14 S, ATPase and motile activity of, ATP analog specificity of)

IT Dyneins
RL: BIOL (Biological study)
(22 S, ATPase and motile activity of, ATP analog specificity of)

IT Meromyosins
RL: BIOL (Biological study)
(heavy, ATPase of, ATP analogs specificity of)

IT Meromyosins
RL: BIOL (Biological study)
(heavy, acto-, ATPase and motile activity of, ATP analog specificity of)

IT Proteins, specific or class
RL: BIOL (Biological study)
(kinesins, ATPase and motile activity of, ATP analog specificity of)

IT Biological transport
(translocation, filament-driven, in cytoskeleton, ATP analog specificity of, dyneins and kinesin and heavy meromyosin ATPase specificity in relation to)

IT 56-65-5, 5'-ATP, biological studies 73-04-1, 3'-Deoxy ATP 1927-31-7, 2'-Deoxy ATP 2677-93-2 3130-39-0 16409-13-5, Formycin 5'-triphosphate 23197-96-8 23567-97-7 24027-80-3 35094-46-3, Adenosine 5'-O-(3-thiotriphosphate) 37482-17-0 53696-59-6, 8-Azido ATP 58976-48-0 58976-49-1 59261-35-7 59261-36-8
RL: BIOL (Biological study)
(ATPase and motile activities of dynein and kinesin and meromyosin specificity for)

IT 9000-83-3, ATPase
RL: BIOL (Biological study)
(of dyneins and kinesins and meromyosin, ATP analogs specificity of, filament motility in relation to)

L31 ANSWER 9 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1990:567651 HCAPLUS

DN 113:167651

TI A polymorphism peculiar to bipolar actin bundles

AU Francis, Noreen R.; DeRosier, David J.

CS Rosenstiel Basic Med Sci. Res. Cent., Brandeis Univ., Waltham, MA, 02254, USA

SO Biophys. J. (1990), 58(3), 771-6
CODEN: BIOJAU; ISSN: 0006-3495

DT Journal

LA English

CC 6-3 (General Biochemistry)

AB Both muscle and nonmuscle actins produced Mg paracrystals which were indistinguishable from one another.

Contrary to some previous reports, Ca^{2+} caused no change in filament organization for either type of **actin**. The most ordered **paracrystals** consisted of hexagonally packed filaments with opposite polarities. It is suggested that this mode of packing permits a form of disorder not previously described, which may account for some puzzling aspects of earlier observations and may prove useful in analyzing **actin** bundles formed, for example, with erythrocyte band 4.9 protein.

ST bipolar **actin** bundle polymorphism; **magnesium**
actin paracrystal polymorphism
 IT **Quasicrystals**
 (of **actin** and **magnesium**, polymorphism of)
 IT **Actins**
 RL: BIOL (Biological study)
 (F-, **paracrystals** of, polymorphism of, **magnesium** in
 relation to)
 IT Organelle
 (**actin** bundle, bipolar, organization of, **actin**
magnesium paracrystal polymorphism in relation to)
 IT 7439-95-4D, **Magnesium**, **actin** filament
 complexes
 RL: BIOL (Biological study)
 (**paracrystals** of, polymorphism of)
 IT 7439-95-4D, **Magnesium**, **actin** filament
 complexes
 RL: BIOL (Biological study)
 (**paracrystals** of, polymorphism of)
 RN 7439-95-4 HCAPLUS
 CN **Magnesium** (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 10 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1988:90001 HCAPLUS

DN 108:90001

TI **Isolation and characterization of actin** from
 cultured BHK cells

AU Koffer, Anna; Dickens, Michael J.

CS MRC Cell Biophys. Unit, London, WC2B 5RL, UK

SO J. Muscle Res. Cell Motil. (1987), 8(5), 397-406

CODEN: JMRMD3; ISSN: 0142-4319

DT Journal

LA English

CC 6-3 (General Biochemistry)

AB Cytoplasmic **actin** from cultured fibroblasts has been purified to homogeneity and characterized with respect to its polymn. and structure. It was qual. similar to muscle **actin** in all respects, but significant quant. differences in its properties were demonstrated. Although BHK **actin** did not polymerize in unfractionated cytoplasmic exts., the purified BHK **actin** polymd. into filaments both in the presence of **Mg** and **Ca**. The crit. concn., measured by the DNase I inhibition assay and by fluorimetry, was the same as that of muscle **actin** both in **Mg** and **Ca**. Polymn. of pyrene-labeled BHK and muscle **actin** was followed by fluorimetry. Significant differences in kinetics were found under both ionic conditions tested. In the absence of Mg^{2+} (0.2 mM CaCl_2 , 85 mM KCl), BHK **actin** polymd. at a much slower rate than did muscle **actin**. In the presence of **Mg** and EGTA, the nucleation phase for BHK **actin** polymn. was shorter than that for muscle **actin** and the kinetics of polymn. was different. The structure of BHK **actin** filaments in the electron micrographs was very similar to that of muscle **actin**. In high concns. of **Mg**, BHK **actin** formed **paracrystals** which had the same appearance as muscle

actin paracrystals. However, Ca-induced formation of **actin paracrystals** required higher concn. of Ca^{2+} for BHK **actin** than for muscle **actin** (12 mM and 8 mM, resp.). These results suggest differences in divalent cation binding to both high- and low-affinity sites of the two **actins**.

- ST BHK cell **actin**; calcium binding **actin** cytoplasm; magnesium binding **actin** cytoplasm; polymn **actin**
BHK cell
- IT Cytoplasm
(**actin** of, of animal cell, isolation and polymn. and structure of, muscle **actin** comparison with)
- IT **Actins**
RL: BIOL (Biological study)
(of BHK cell, isolation and polymn. and structure of, muscle **actins** comparison with)
- IT Animal cell line
(BHK, **actin** of, isolation and polymn. and structure of, muscle **actins** comparison with)
- IT **Actins**
RL: BIOL (Biological study)
(G-, of BHK cells, polymn. of, kinetics of)
- IT 67-42-5, EGTA
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in magnesium presence acceleration by)
- IT 7439-95-4, **Magnesium**, biological studies 7440-70-2, Calcium, biological studies
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in presence of, kinetics of)
- IT 7439-95-4, **Magnesium**, biological studies
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in presence of, kinetics of)
- RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

- L31 ANSWER 11 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1983:554040 HCAPLUS
DN 99:154040
- TI **Structural studies of F-actin**
AU Egelman, Edward H.; DeRosier, David J.
CS Biophys. Rosenst. Res. Cent., Brandeis Univ., Waltham, MA, USA
SO Actin: Struct. Funct. Muscle Non-Muscle Cells, Proc. Int. Semin., Int. Congr. Biochem., 12th (1983), Meeting Date 1982, 17-24. Editor(s): Dos Remedios, Cristobal G.; Barden, Julian A. Publisher: Academic, North Ryde, Australia.
CODEN: 50FOAW
- DT Conference
LA English
CC 6-3 (General Biochemistry)
- AB A model of the **actin** filament, developed from studies of isolated neg. stained F-**actin**, is quite consistent with images of neg. stained angle layered aggregates and freeze-etched single filaments. Further, the transform of the model agrees with obsd. x-ray patterns of muscle and of **actin** gels. All of these patterns show that the mass of the **actin** subunit is oriented approx. along the 59 .ANG. helix. Finally, by treating **Mg** $^{2+}$ **paracrystals** as deformed angle layered aggregates, the obsd. appearance of **paracrystals** was simulated and a certain class of **actin** models were explained as arising from an artifact of superposition.
- ST **actin magnesium paracrystal** model

IT Microfilament and Microtubule
 (of **actin**, **magnesium**-induced, structure of, model
 for)
 IT **Actins**
 RL: BIOL (Biological study)
 (F-, **magnesium**-induced **paracrystals** of, structure
 of, model for)
 IT **7439-95-4**, uses and miscellaneous
 RL: USES (Uses)
 (**actin paracrystals** induced by, structure of, model
 for)
 IT **7439-95-4**, uses and miscellaneous
 RL: USES (Uses)
 (**actin paracrystals** induced by, structure of, model
 for)
 RN 7439-95-4 HCAPLUS
 CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1982:157741 HCAPLUS
 DN 96:157741
 TI Purification and **characterization** of tropomyosin from bovine
 thyroid
 AU Kobayashi, Ryoji; Tawata, Masato; Mace, Myles L., Jr.; Bradley, William
 A.; Field, James B.
 CS Diabetes Res. Cent., St. Luke's Episcopal Hosp., Houston, TX, 77030, USA
 SO Biochim. Biophys. Acta (1982), 702(2), 220-32
 CODEN: BBACAQ; ISSN: 0006-3002
 DT Journal
 LA English
 CC 6-3 (General Biochemistry)
 AB A tropomyosin was purified from bovine thyroid and its properties compared
 with those of rabbit skeletal muscle tropomyosin. Thyroid tropomyosin was
 sepd. from contaminating vascular smooth muscle tropomyosin by
 hydroxylapatite chromatog. Thyroid tropomyosin resembles tropomyosin from
 other nonmuscle cells in regard to subunit size, mobility on
 SDS-polyacrylamide gels in the presence and absence of 6M urea, amino acid
 compn., and morphol. Thyroid tropomyosin has a subunit mol. wt. of 30,000
 and forms **Mg2+ paracrystals** with an axial period of
 345 .ANG., whereas **paracrystal** periodicities of muscle
 tropomyosins are 400 .ANG.. The amino acid compn. of thyroid tropomyosin
 is very similar to that of other nonmuscle cell tropomyosins. However,
 thyroid tropomyosin differs from other nonmuscle cell tropomyosins in its
 ability to bind to **actin** and troponin. Both thyroid and muscle
 tropomyosins bind to **actin** in a similar ratio of 1
 tropomyosin/6-7 **actin** monomers at satn. The binding of
 tropomyosin to F-**actin** is strongly dependent on the **Mg2**
 + concn. With thyroid tropomyosin, binding begins at 1 mM and is complete
 at .apprx.4-5 mM **Mg2+**, whereas with muscle tropomyosin, binding
 is initiated at 1 mM **Mg2+** and reaches satn. at 2-3 mM
Mg2+. At satn., both thyroid and muscle tropomyosins bind to the
 same binding site(s) on **actin** filaments with similar affinity.
 In contrast to platelet tropomyosin, thyroid tropomyosin binds to skeletal
 muscle troponin and troponin T. One-dimensional peptide maps of thyroid
 and rabbit skeletal muscle tropomyosin are distinctly different from each
 other. The air oxidn. of thyroid tropomyosin yields covalently linked
 dimers similar to skeletal muscle tropomyosin dimers. In contrast to
 muscle tropomyosins, [32P]phosphate is not incorporated into thyroid
 tropomyosin.
 ST tropomyosin thyroid gland
 IT Tropomyosins

RL: BIOL (Biological study)
 (of thyroid, purifn. and properties of)
 IT Amino acids, biological studies
 RL: BIOL (Biological study)
 (of tropomyosin, of thyroid)
 IT Thyroid gland, composition
 (tropomyosin of)
 IT Troponins
 RL: BIOL (Biological study)
 (tropomyosin of thyroid binding to)
 IT **Actins**
 RL: BIOL (Biological study)
 (F-, tropomyosin of thyroid binding to)
 IT Troponins
 RL: BIOL (Biological study)
 (T, tropomyosin of thyroid binding to)
 IT **7439-95-4**, biological studies
 RL: BIOL (Biological study)
 (tropomyosin of thyroid binding to **actin** response to)
 IT **7439-95-4**, biological studies
 RL: BIOL (Biological study)
 (tropomyosin of thyroid binding to **actin** response to)
 RN 7439-95-4 HCAPLUS
 CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 13 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1981:402190 HCAPLUS
 DN 95:2190
 TI **Formation of actin paracrystals** from sea
 urchin egg extract under **actin** polymerizing conditions
 AU Mabuchi, Issei; Nonomura, Yoshiaki
 CS Coll. Gen, Educ., Univ. Tokyo, Tokyo, 153, Japan
 SO Biomed. Res. (1981), 2(2), 143-53
 CODEN: BRES5
 DT Journal
 LA English
 CC 6-3 (General Biochemistry)
 AB A monomeric **actin** fraction was obtained from a high-speed
 supernatant of an ext. of unfertilized sea urchin (*Anthocidaris*
crassipina) eggs by gel filtration chromatog. Ppts. formed on concn. of
 this fraction at 4.degree. were **paracrystals** of **actin**.
 These **paracrystals** contained **actin** and a
 56,000-mol.-wt. protein at a molar ratio of 4.8-5.0:1. The
paracrystals dissolved in a low-ionic strength buffer soln. which
 depolymerizes **actin** and reformed on addn. of 0.1M KCl or 2 mM
MgCl2 at 0.degree.. Electron microscopy and optical diffraction
 studies showed that the **paracrystals** had transverse bands, the
 spacing of which was 1/3 of the distance between the crossover points of
 the 2 long-pitch right-handed helical strands of the **actin**
 filaments. Further, the **actin** filaments in the
paracrystals had a helical configuration in which there were 41
 monomers/19 turns of the left-handed genetic **actin** helix. These
 structural properties may indicate that the **paracrystal** is an in
 vitro reconstituted microvillar **actin** core which is known to
 elongate on fertilization.
 ST **actin paracrystal** egg sea urchin
 IT *Anthocidaris crassipina*
 (actins of eggs of, structure of **paracrystals** of)
 IT Egg
 (actins of, **paracrystal** structure of, of sea
 urchin, microvillar core in relation to)

IT **Actins**
 RL: BIOL (Biological study)
 (paracrystals of, structure of, of sea urchin egg)

IT Chains, chemical
 (helical, of **actin** filaments in **paracrystals**)

L31 ANSWER 14 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1980:123710 HCAPLUS
 DN 92:123710
 TI Conformation changes of **actin** during formation of
 filaments and **paracrystals** and upon interaction with DNase I,
 cytochalasin B, and phalloidin
 AU Harwell, O. Daniel; Sweeney, Mary Lee; Kirkpatrick, Francis H.
 CS Sch. Med. Dent., Univ. Rochester, Rochester, NY, 14642, USA
 SO J. Biol. Chem. (1980), 255(3), 1210-20
 CODEN: JBCHA3; ISSN: 0021-9258
 DT Journal
 LA English
 CC 6-3 (General Biochemistry)
 AB Spin labels attached to rabbit muscle **actin** became more
 immobilized on conversion of **actin** from the G state to
 the F state with 50 mM KCl. Titrn. of G-**actin** with
MgCl2 produced F-**actin**-like EPR spectra between 2 and 5
 mM, and F-**actin** filaments by electron microscopy. Higher
 concns. of **MgCl2** produced bundles of **actin** and
 eventually **paracrystals**, accompanied by further immobilization
 of spin labels. The effects of **MgCl2** and KCl were competitive:
 addn. of **MgCl2** to 50 mM converted F-**actin** (50 mM KCl)
 to **paracryst.** (P) **actin**; the reverse titrn. (0-200 mM
 KCl in the presence of 20 mM **MgCl2**) was less complete. Addn. of
 DNase I to **paracryst. actin** gave the expected
 amorphous electron microg. pattern, and the **actin** was not
 sedimentable at 400,000 g (1 h). EPR showed that the
actin was in the G conformation. Addn. of DNase I to
paracryst. actin gave the F conformation (EPR) but the
actin was G by electron microscopy. Phalloidin
 converted G-**actin** to F-**actin**, had no effect
 on F-**actin**, and converted P-**actin** to the F state by
 electron microscopy but maintained the P conformation by EPR.
 Cytochalasin B produced no effects observable by EPR or centrifugation but
 untwisted **paracrystals** into nets. Since **actin**
 retained its P conformation by EPR in 2 states which were morphol. not P,
 the P state is apparently a distinct conformation of the **actin**
 mol. and **actin** filaments aggregate to form bundles (and
 eventually **paracrystals**) when **actin** monomers can enter
 the P conformation.

ST phalloidin **actin** conformation; cytochalasin B **actin**
 conformation; DNase I **actin** conformation; **actin**
 conformation filament **paracrystal**

IT **Actins**
 RL: BIOL (Biological study)
 (conformational changes of, during G-to-F transition and
 modifier interaction)

IT Chains, chemical
 (conformational transitions of, of **actin** during G
 -to-F transition and modifier interaction)

IT 7447-40-7, properties 7786-30-3, properties 9003-98-9
 14930-96-2 17466-45-4
 RL: PRP (Properties)
 (conformation of **actin** response to)

IT 7786-30-3, properties
 RL: PRP (Properties)
 (conformation of **actin** response to)

RN 7786-30-3 HCAPLUS
 CN Magnesium chloride (MgCl2) (9CI) (CA INDEX NAME)

Cl-Mg-Cl

L31 ANSWER 15 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1980:106090 HCAPLUS
 DN 92:106090
 TI **Depolymerization of actin** in concentrated solutions of
 divalent metal chlorides
 AU Biro, E. N. A.; Ven'yaminov, S. Yu.
 CS Dep. Biochem., Eotvos Lorand Univ., Budapest, Hung.
 SO Acta Biochim. Biophys. Acad. Sci. Hung. (1979), 14(1-2), 31-42
 CODEN: ABBPAP; ISSN: 0001-5253
 DT Journal
 LA English
 CC 6-3 (General Biochemistry)
 AB **Actin** transferred to concd. (0.3-1.2M) **MgCl₂** solns.
 depolymd. completely. When protected by a high excess of ATP,
actin in this **MgCl₂**-depolymd. state was stable for
 several days in the cold. In the absence of excess ATP it slowly
 denatured. Chiroptical data and proteolysis expts. showed that
MgCl₂-depolymd. **actin** is in a native, folded state,
 although its helix content is considerably decreased. By dissolving F-
actin pellets or **actin** pptd. in the **paracryst.**
 state in concd. **MgCl₂** solns. in the presence of ATP, very concd.
 (100-200 mg/mL) monomeric **actin** solns. were prepd.
 CaCl₂ and MnCl₂ had similar effects, although these were not studied in
 detail.
 ST **actin** depolymerization divalent metal chloride; **magnesium**
chloride depolymerization **actin**; calcium chloride depolymerization
actin; manganese chloride depolymerization **actin**
 IT Chains, chemical
 (conformation of, of **actin** after depolymerization in concd. divalent
 metal chloride soln.)
 IT **Actins**
 RL: RCT (Reactant)
 (depolymerization of, in concd. divalent metal chloride soln., with ATP
 stabilization)
 IT Depolymerization
 (of **actins**, in concd. divalent metal chloride soln.)
 IT 56-65-5, biological studies
 RL: BIOL (Biological study)
 (**actin** depolymerization by concd. divalent metal chloride soln.
 stabilization by)
 IT 7773-01-5 7786-30-3, reactions 10043-52-4, reactions
 RL: BIOL (Biological study)
 (depolymerization of **actin** in concd. soln. of)
 IT 7786-30-3, reactions
 RL: BIOL (Biological study)
 (depolymerization of **actin** in concd. soln. of)
 RN 7786-30-3 HCAPLUS
 CN Magnesium chloride (MgCl₂) (9CI) (CA INDEX NAME)

Cl-Mg-Cl

L31 ANSWER 16 OF 18 HCAPLUS COPYRIGHT 2002 ACS
 AN 1978:524805 HCAPLUS
 DN 89:124805
 TI Interaction of **actin** with **divalent cations**.
 1. The effect of various cations on the physical state of **actin**
 AU Strzelecka-Golaszewska, Hanna; Prochniewicz, Ewa; Drabikowski, Witold
 CS Dep. Biochem. Nerv. Syst. Muscle, Nencki Inst. Exp. Biol., Warsaw, Pol.

SO Eur. J. Biochem. (1978), 88(1), 219-27
 CODEN: EJBCAI; ISSN: 0014-2956

DT Journal
 LA English
 CC 6-3 (General Biochemistry)

AB The effect of various divalent cations on the state of aggregation of **actin** monomers was studied at pH 7.6 by viscosity measurements, detn. of the protein sedimenting at high and low centrifugal forces, dephosphorylation of **actin**-bound ATP, and electron microscopy. The metal concn. dependence of the degree of **actin** polymn. in the presence of Ca²⁺, **Mg**²⁺, Sr²⁺, and Mn²⁺ was the same. All these cations produced typical double-stranded F-**actin** filaments. Ni²⁺ and Zn²⁺ induced polymn. at lower concns. than Mn²⁺ and alk. earth metals, but the resultant polymers had lower viscosities. Examn. in the electron microscope showed that Ni²⁺ produces typical F-**actin** filaments, which, however, tend to break into short fragments. In the presence of Zn²⁺ globular aggregates coexisting with the filaments were obsd. In the presence of Mn²⁺ or alk. earth metals at mM concns. the F-**actin** filaments assembled into netlike **paracrystals** which were transformed into side-by-side aggregates when the cation concn. was increased. The cation concn. dependences of polymn. and of **paracrystal** formation suggested that these 2 processes occur on binding of these cations to distinct classes of sites and that the order of affinities to sites of weaker binding, involved in the **paracrystal** formation, is as follows: Mn²⁺ > Ca²⁺ > **Mg**²⁺ = Sr²⁺. Unlike the other cations, Zn²⁺, at concns. higher than that necessary for max. polymn., caused pptn. of G-**actin** without formation of ordered structures.

ST **actin** aggregation cation
 IT **Actins**
 RL: BIOL (Biological study)
 (aggregation of, divalent cations effect on)

IT Cations
 (divalent, **actin** aggregation response to)

IT Molecular association
 (self-, of **actin** in divalent cation presence)

IT 7439-95-4, biological studies 7439-96-5, biological studies
 7440-02-0, biological studies 7440-24-6, biological studies 7440-66-6,
 biological studies 7440-70-2, biological studies
 RL: BIOL (Biological study)
 (**actin** aggregation response to)

IT 7439-95-4, biological studies
 RL: BIOL (Biological study)
 (**actin** aggregation response to)

RN 7439-95-4 HCAPLUS
 CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 17 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1975:39842 HCAPLUS
 DN 82:39842

TI Biochemical and **structural** studies of actomyosin-like proteins from nonmuscle cells. II. Purification, properties, and membrane association of **actin** from amebae of Dictyostelium discoideum

AU Spudich, James A.; Lord, Kathy
 CS Dep. Biochem. Biophys., Univ. California, San Francisco, Calif., USA
 SO J. Biol. Chem. (1974), 249(18), 6013-20
 CODEN: JBCHA3

DT Journal
 LA English
 CC 6-3 (General Biochemistry)

- AB Actomyosin was obtained from the title amebas by the method of M. Clarke and J. A. Spudich (1974), and **actin** was purified from this prepn. The sp. activity of this **actin** for activation of heavy meromyosin ATPase was comparable to that of muscle **actin**. The ameba **actin** and muscle **actin** comigrated on Na dodecyl sulfate (I)-acrylamide gels at a rate corresponding to a mol. wt. of .apprx. 42,000. The ameba **actin** formed **Mg²⁺** **paracrystals** with a repeating band pattern of 300-400 .ANG., similar to muscle and platelet **actins**. Purifn. of ameba membranes by sedimentation equil. on sucrose gradients resulted in an .apprx. 3-fold copurifn. of **actin**. Sepn. of membrane components by I gel electrophoresis established that the myosin and **actin** components maintained a const. ratio relative to other components in membranes subjected to centrifugation for varying periods of time. Further, **MgATP** released all of the myosin and .apprx. 1/2 of the **actin** from the membranes. In the absence of **MgATP**, .apprx. 10% of the total cellular **actin** was recovered with membranes. Thus, .apprx. 5% of the **actin** was assocd. with membranes in a **MgATP**-stable linkage. This assocn. may be analogous to **actin** assocn. with z-lines in muscle. A model for nonrandom movement in nonmuscle cells was constructed which is consistent with the above results and with the principles of **actin**-myosin interaction in sarcomeres.
- ST cell membrane Dictyostelium **actin**; **magnesium** ATP
Dictyostelium **actin**; movement Dictyostelium **actin**
- IT Cell membrane
(**actin** assocd. with, of Dictyostelium discoideum, nonrandom movement model in relation to)
- IT Dictyostelium discoideum
(**actin** of, sepn. and characterization of, nonrandom movement model in relation to)
- IT **Actins**
RL: BIOL (Biological study)
(of Dictyostelium discoideum, sepn. and charactization of, nonrandom movement model in relation to)
- IT Adenosine 5'-(tetrahydrogen triphosphate), **magnesium** salt (1:1), **magnesium** complexes
Magnesium, ATP complexes
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum in response to, cell membrane assocn. in relation to)
- IT 7439-95-4, biological studies
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum **paracrystal** formation with)
- IT 7439-95-4, biological studies
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum **paracrystal** formation with)
- RN 7439-95-4 HCAPLUS
- CN **Magnesium** (8CI, 9CI) (CA INDEX NAME)

Mg

- L31 ANSWER 18 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1971:71735 HCAPLUS
DN 74:71735
TI **Polymorphism of F-actin. I. Three forms of paracrystals**
AU Kawamura, Masaru; Maruyama Koscak
CS Biol. Inst., Univ. Tokyo, Tokyo, Japan
SO J. Biochem. (Tokyo) (1970), 68(6), 885-99
CODEN: JOBIAO

DT Journal
 LA English
 CC 2 (General Biochemistry)
 AB Polymorphic assemblies of F-actin were studied at acid pH using an electron microscope. Three distinct types of ordered aggregates, designated as TYPE I, II, and III, were found and their basic structural features were described. TYPE I was a net with 2-fold rotational symmetry and the tetragon had rms of 320 .ANG. in length and the angles between the arms were 28.degree. and 152.degree., resp. For the formation of TYPE I, the optimal concn. of KCl and ATP were 0.1-0.2M and 0.4mM at pH 5.0, resp. TYPE II was also a net similar to TYPE I, but the distribution of matter was different from TYPE I, and TYPE II was more rigid in structure. The conditions of formation of TYPE II were not elucidated. TYPE III was a side-by-side aggregate of F-actin similar to that formed in the presence of **MgCl2** (Hanson, 1967), but TYPE III appeared to be somewhat different in shape. ATP or KCl was not necessary for the formation of TYPE III. F-actin showed ATPase [EC 3.6.1.3] activity at acid pH. This ATPase action was discussed in relation to the formation of the TYPE I **paracrystal**.
 ST polymorphism F actin; actins polymorphism; structure F actin
 IT Crystal structure
 (of actin F)
 IT Phosphatases, adenosine tri-
 (of actin F polymorphic crystals)
 IT Actins
 RL: BIOL (Biological study)
 (polymorphism of F-, structure of)

=> d l30 all hitstr

~~L30~~ ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
 AN 1985:109256 HCAPLUS
 DN 102:109256
 TI A new simple method of preparing actin from chicken gizzard
 AU Ebashi, Setsuro
 CS Fac. Med., Univ. Tokyo, Tokyo, 113, Japan
 SO J. Biochem. (Tokyo) (1985), 97(2), 693-5
 CODEN: JOBIAO; ISSN: 0021-924X
 DT Journal
 LA English
 CC 9-6 (Biochemical Methods)
 AB A simple method for prepg. actin from chicken gizzard is described. The method involves a series of centrifugations and then acetone treatment, resulting in an acetone powder of the gizzard. The acetone powder is then subjected to further centrifugation steps, and the purity of the resulting actin prepn. is examd. by SDS-polyacrylamide gel electrophoresis and electron microscopic profiles. This method takes advantage of the property of gizzard tropomyosin that it does not form **Mg paracrystals** readily. The method gives actins with higher specific viscosity than the conventional method, it removes F-actin disaggregating factors, and it gives a yield of usually 15-20 mg of actin.
 ST actin prepn chicken gizzard; centrifugation actin prepn
 IT Tropomyosins
 RL: PREP (Preparation)
 (actin prepn. from chicken gizzard in magnesium presence in relation to)
 IT Chicken
 (actin prepn. from gizzard of)
 IT Gizzard
 (actin prepn. from, of chicken by centrifugation)
 IT Centrifugation
 (in actin prepn. from chicken gizzard)

IT **Actins**
 RL: **PREP (Preparation)**
 (prepn. of, from chicken gizzard by centrifugation)

IT **Actins**
 RL: **PREP (Preparation)**
 (F-, prepn. of, from chicken gizzard by centrifugation)

IT **7439-95-4, biological studies**
 RL: ANST (Analytical study)
 (actin prepn. from chicken gizzard in presence of,
 tropomyosin in relation to)

IT **7439-95-4, biological studies**
 RL: ANST (Analytical study)
 (actin prepn. from chicken gizzard in presence of,
 tropomyosin in relation to)

RN 7439-95-4 HCAPLUS
 CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

=> fil biosis
 FILE 'BIOSIS' ENTERED AT 17:02:27 ON 11 FEB 2002
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FILE COVERS 1969 TO DATE.
 CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT
 FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 6 February 2002 (20020206/ED)

The BIOSIS file has been reloaded. Enter HELP RLOAD and HELP REINDEXING
 for details.

=> d all 161

L61 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
 AN 1995:166199 BIOSIS
 DN PREV199598180499
 TI Concentrated Tris Solutions for the **Preparation**,
 Depolymerization and Assay of **Actin**: Application to Erythroid
Actin.
 AU Pinder, Jennifer C.; Sleep, J. A.; Bennett, Pauline M.; Gratzner, W. B.
 CS Med. Res. Council Muscle Cell Motility Unit, King's Coll., 26-29 Drury
 Lane, London WC2B 5RL UK
 SO Analytical Biochemistry, (1995) Vol. 225, No. 2, pp. 291-295.
 ISSN: 0003-2697.
 DT Article
 LA English
 AB High concentrations of Tris are effective in dissociating **actin**
 -containing complexes, such as the red cell membrane cytoskeleton. A
 preparative procedure for red cell **actin** is based on the
 dissociation of the membrane skeletal complex in a buffer containing 1 M
 Tris hydrochloride, followed by gel filtration chromatography in the same
 medium. The **actin** is recovered as the monomer and is fully
 native, as judged by its critical concentration of polymerization,
 inhibition of DNase I, stimulation of myosin ATPase, and the appearance in
 the electron microscope of filaments, both bare and decorated with heavy
 meromyosin, and of **magnesium** ion-induced **paracrystals**.
 The Tris solution causes rapid depolymerization of F-**actin** with
 no denaturation, and the solution of monomeric **actin** in this
 medium is stable for many weeks in the cold; concentrated Tris is more
 reliable than guanidinium chloride for the depolymerization of F-
actin in the estimation of total **actin** concentration by

the DNase I inhibition assay.

CC Biochemical Methods - Proteins, Peptides and Amino Acids *10054
 Biochemical Studies - Proteins, Peptides and Amino Acids 10064
 Biophysics - Membrane Phenomena *10508
 Enzymes - Methods *10804
 Blood, Blood-Forming Organs and Body Fluids - Blood Cell Studies *15004

IT Major Concepts
 Blood and Lymphatics (Transport and Circulation); Enzymology
 (Biochemistry and Molecular Biophysics); Membranes (Cell Biology);
 Methods and Techniques

IT Chemicals & Biochemicals
 TRIS; **ACTIN**; ATPASE; DNASE I

IT Miscellaneous Descriptors
 DNASE I INHIBITION ASSAY; MYOSIN ATPASE; RED CELL MEMBRANE CYTOSKELETON

RN 77-86-1Q (TRIS)
 126-72-7Q (TRIS)
 17096-07-0Q (TRIS)
 132579-20-5 (**ACTIN**)
 9000-83-3 (ATPASE)
 9003-98-9 (DNASE I)

=> fil medline

FILE 'MEDLINE' ENTERED AT 17:18:51 ON 11 FEB 2002

FILE LAST UPDATED: 9 FEB 2002 (20020209/UP). FILE COVERS 1958 TO DATE.

On April 22, 2001, MEDLINE was reloaded. See HELP RLOAD for details.

MEDLINE now contains IN-PROCESS records. See HELP CONTENT for details.

MEDLINE is now updated 4 times per week. A new current-awareness alert frequency (EVERYUPDATE) is available. See HELP UPDATE for more information.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2001 vocabulary. Enter HELP THESAURUS for details.

The OLDMEDLINE file segment now contains data from 1958 through 1965. Enter HELP CONTENT for details.

Left, right, and simultaneous left and right truncation are available in the Basic Index. See HELP SFIELDS for details.

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

=> d all tot

L84 ANSWER 1 OF 4 MEDLINE
 AN 92256699 MEDLINE
 DN 92256699 PubMed ID: 1581508
 TI Linear dichroism of acrylodan-labeled tropomyosin and myosin subfragment 1 bound to **actin** in myofibrils.
 AU Szczesna D; Lehrer S S
 CS Department of Muscle Research, Boston Biomedical Research Institute, Massachusetts 02114.
 NC HL-22461 (NHLBI)
 SO BIOPHYSICAL JOURNAL, (1992 Apr) 61 (4) 993-1000.
 Journal code: A5S; 0370626. ISSN: 0006-3495.
 CY United States
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS Priority Journals
 EM 199206
 ED Entered STN: 19920626
 Last Updated on STN: 19920626

Entered Medline: 19920618

AB Muscle contraction can be activated by the binding of myosin heads to the thin filament, which appears to result in thin filament structural changes. In vitro studies of reconstituted muscle thin filaments have shown changes in tropomyosin-actin geometry associated with the binding of myosin subfragment 1 to actin. Further information about these structural changes was obtained with fluorescence-detected linear dichroism of tropomyosin, which was labeled at Cys 190 with acrylodan and incorporated into oriented ghost myofibrils. The fluorescence from three sarcomeres of the fibril was collected with the high numerical aperture objective of a microscope and the dichroic ratio, R (0/90 degrees), for excitation parallel/perpendicular to the fibril, was obtained, which gave the average probe dipole polar angle, Theta. For both acrylodan-labeled tropomyosin bound to actin in fibrils and in Mg2+ paracrystals, Theta congruent to 52 degrees +/- 1.0 degrees, allowing for a small degree of orientational disorder. Binding of myosin subfragment 1 to actin in fibrils did not change Theta; i.e., the orientation of the rigidly bound probe on tropomyosin did not change relative to the actin axis. These data indicate that myosin subfragment 1 binding to actin does not appreciably perturb the structure of tropomyosin near the probe and suggest that the geometry changes are such as to maintain the parallel orientation of the tropomyosin and actin axes, a finding consistent with models of muscle regulation. Data are also presented for effects of MgADP on the orientation of labeled myosin subfragment 1 bound to actin in myofibrils.

CT Check Tags: Animal; Support, Non-U.S. Gov't; Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.

2-Naphthylamine: AA, analogs & derivatives

Actins: CH, chemistry

Adenosine Diphosphate

Binding Sites

Biophysics

Fluorescent Dyes

Models, Chemical

Myofibrils: CH, chemistry

*Myosin Subfragments: CH, chemistry

Rabbits

Spectrometry, Fluorescence

*Tropomyosin: CH, chemistry

RN 58-64-0 (Adenosine Diphosphate); 86636-92-2 (acrylodan); 91-59-8 (2-Naphthylamine)

CN 0 (Actins); 0 (Fluorescent Dyes); 0 (Myosin Subfragments); 0 (Tropomyosin)

L84 ANSWER 2 OF 4 MEDLINE

AN 92223214 MEDLINE

DN 92223214 PubMed ID: 1839660

TI [Purification and biochemical characteristics of actin from the rat malignancy sarcoma-45].

Ochistka i biokhimicheskaya kharakteristika aktina iz zlokachestvennoi opukholi krys sarkoma-45.

AU Senchuk V V; Pikulev A T; Dashkevich I N

SO BIOKHIMIYA, (1991 Dec) 56 (12) 2235-43.

Journal code: A28; 0372667. ISSN: 0320-9725.

CY USSR

DT Journal; Article; (JOURNAL ARTICLE)

LA Russian

FS Priority Journals

EM 199205

ED Entered STN: 19920607

Last Updated on STN: 19920607

Entered Medline: 19920521

AB Actin was purified from rat sarcoma-45 by using affinity chromatography on DNase I agarose. Actin was detected in the soluble and cytoskeletal fractions. The molecular mass of the

protein was found to be equal to 45 kDa. The tumour **actin** specifically reacted with the antibody against skeletal muscle **actin**, inhibited the DNAase I activity and activated in the fibrillar state **Mg(2+)**-ATPases of **sarcoma-45** and skeletal muscle myosins. The activating effect of the tumour protein was lower than that of its skeletal muscle counterpart. V8-protease peptide mapping revealed a similarity between tumour and brain **actins**. **Sarcoma-45 actin** was found to contain beta- and gamma-**actin** isoforms and an unusual isoform which appeared to be more acidic than the alpha-**actin** isoform.

CT Check Tags: Animal

Actins: IP, isolation & purification

***Actins: ME, metabolism**

Ca(2+) Mg(2+)-ATPase: ME, metabolism

Deoxyribonuclease I: ME, metabolism

Electrophoresis, Gel, Two-Dimensional

Electrophoresis, Polyacrylamide Gel

Myosin: ME, metabolism

Pancreas: EN, enzymology

Rats

***Sarcoma, Experimental: ME, metabolism**

CN 0 (**Actins**); 0 (**Myosin**); EC 3.1.21.1 (**Deoxyribonuclease I**); EC 3.6.1.- (**Ca(2+) Mg(2+)-ATPase**)

L84 ANSWER 3 OF 4 MEDLINE

AN 84000622 MEDLINE

DN 84000622 PubMed ID: 6137243

TI Comparison of the properties of two kinds of preparations of human blood platelet **actin** with **sarcomeric actin**.

AU Coue M; Landon F; Olomucki A

SO BIOCHIMIE, (1982 Mar) 64 (3) 219-26.

Journal code: A14; 1264604. ISSN: 0300-9084.

CY France

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 198311

ED Entered STN: 19900319

Last Updated on STN: 19900319

Entered Medline: 19831123

AB A new procedure of purification of **actin** from human blood platelets was used. This method starting from acetone powder of whole platelets gives a much higher yield than the one previously described (**actin I**) (Landon et al. (1977) Eur. J. Biochem., 81, 571-577). This **actin II** preparation has the same reduced viscosity as skeletal muscle **actin**, while the reduced viscosity of **actin I** preparation is about 1/10 of this value. Moreover **actin I** has the form of very short filaments as shown by electron microscopy. After an extra step of purification **actin I**, when polymerized, acquired a high reduced viscosity. We confirmed that platelet and **sarcomeric actins** are similar in their polymerization properties and their ability to activate muscular myosin. A circular dichroism study showed that the overall conformation of both **actins** are similar, but the environment of their aromatic chromophores is different.

CT Check Tags: Animal; Comparative Study; Human; Support, Non-U.S. Gov't

Actins: BL, blood

Actins: IP, isolation & purification

***Actins: PD, pharmacology**

Adenosinetriphosphatase: ME, metabolism

***Blood Platelets: AN, analysis**

Ca(2+) Mg(2+)-ATPase

Circular Dichroism

Enzyme Activation

Macromolecular Systems

***Myofibrils: AN, analysis**

Protein Conformation

Rabbits

*Sarcomeres: AN, analysis

Viscosity

CN 0 (Actins); 0 (Macromolecular Systems); EC 3.6.1.- (Ca(2+) Mg(2+)-ATPase); EC 3.6.1.3 (Adenosinetriphosphatase)

L84 ANSWER 4 OF 4 MEDLINE

AN 78084385 MEDLINE

DN 78084385 PubMed ID: 145944

TI Human platelet **actin**. Evidence of beta and gamma forms and similarity of properties with **sarcomeric actin**.

AU Landon F; Huc C; Thome F; Oriol C; Olomucki A

SO EUROPEAN JOURNAL OF BIOCHEMISTRY, (1977 Dec) 81 (3) 571-7.

Journal code: EMZ; 0107600. ISSN: 0014-2956.

CY GERMANY, WEST: Germany, Federal Republic of

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 197803

ED Entered STN: 19900314

Last Updated on STN: 19900314

Entered Medline: 19780321

AB Human blood platelet **actin** was purified using 30% sucrose to extract actomyosin and potassium iodide to dissociate actomyosin and to depolymerize **actin**. Pure **actin** thus obtained resembles skeletal muscle **actin** in its polymerization properties, CD spectra and ability to activate myosin myosin **Mg**2+-ATPase. Isoelectric focusing gel analysis shows that human blood platelet **actin** exists in beta and gamma forms. The ratio of beta to gamma forms is of 5 in purified **actin**, in whole cell extract and in all the fractions studied.

CT Check Tags: Animal; Comparative Study; Human

*Actins

Actins: BL, blood

Actins: IP, isolation & purification

Adenosinetriphosphatase: ME, metabolism

*Blood Platelets: AN, analysis

Macromolecular Systems

Molecular Weight

Muscles

Myosin

Organ Specificity

Protein Conformation

Rabbits

CN 0 (Actins); 0 (Macromolecular Systems); 0 (Myosin); EC 3.6.1.3 (Adenosinetriphosphatase)

=> d his

(FILE 'HOME' ENTERED AT 16:22:44 ON 11 FEB 2002)

SET COST OFF

FILE 'REGISTRY' ENTERED AT 16:22:56 ON 11 FEB 2002

E MAGNESIUM/CN

L1 1 S E3

E MAGNESIUM CHLORIDE/CN

L2 1 S E3

FILE 'HCAPLUS' ENTERED AT 16:23:32 ON 11 FEB 2002

E ACTIN/CT

E E3+ALL

L3 1 S E1

E E2+ALL

L4 19413 S E2

L5 1133 S E2 (L) G
 L6 1134 S L3,L5
 L7 4805 S ACTIN (L) G
 L8 4805 S L6,L7
 L9 36371 S ACTIN
 L10 168657 S L1 OR L2
 L11 47463 S MAGNESIUM CHLORIDE OR MGCL2 OR MAGNESIU
 L12 895 S L3-L9 AND L10,L11
 L13 36 S L12 AND ?CRYS?
 L14 130 S L3-L9 AND (PARACRYS? OR PARA(L)?CRYS?)
 L15 24 S L14 AND L10,L11
 L16 36 S L13,L15
 L17 125 S ACTINS/CW (L) PREP/RL
 L18 1 S L16 AND L17
 E HARTMAN J/AU
 L19 22 S E3,E11
 E HARTMAN JAMES/AU
 L20 9 S E3,E8,E9
 E MALIK F/AU
 L21 193 S E3-E12
 E SAKOZIC R/AU
 E SAKOWIC R/AU
 L22 23 S E10,E12
 E FINER J/AU
 L23 16 S E3,E6,E9,E10
 L24 7 S L3-L9,L17 AND L19-L23
 L25 13 S L16 AND (FORMATION OR ISOLATION OR CHARACTERIZATION OR POLYMO
 L26 12 S L25 NOT ASCARIS/TI
 L27 13 S L18,L26
 L28 12 S L27 AND (MAGNESIUM OR MGCL2 OR MG###)
 L29 19 S L24,L28 AND L1-L28
 L30 1 S L29 AND L17
 L31 18 S L29 NOT L30

FILE 'REGISTRY' ENTERED AT 16:44:38 ON 11 FEB 2002

FILE 'HCAPLUS' ENTERED AT 16:44:50 ON 11 FEB 2002

L32 36371 S L3-L9,L17
 L33 31 S L32 AND COMBINATOR?
 L34 22 S L32 AND HIGH(L) (THROUGHPUT OR THROUGH PUT)
 E .BETA.-ACTIN/CT
 E E6+ALL
 L35 732 S L32 AND ?CRYS?
 L36 3 S L35 AND L33,L34
 L37 3 S L36 NOT L30,L31
 L38 1 S L35 AND SOLID(L) PHASE
 E COMBINATORIAL/CT
 L39 6641 S E5+NT OR E6+NT
 E E5+ALL
 L40 125 S E6+NT
 E E8+ALL
 L41 28189 S E2+NT
 L42 20 S L32 AND L39-L41
 L43 20 S L42 NOT L30,L31
 L44 2338 S REACTION+NT/CT AND L32
 L45 32 S L35 AND L44
 L46 75 S L10,L11 AND L44
 L47 292 S (MAGNESIUM OR MGCL2 OR MG###) AND L44
 L48 5 S L45 AND L46,L47
 L49 3 S L48 NOT L30,L31

FILE 'BIOSIS' ENTERED AT 16:55:02 ON 11 FEB 2002

L50 49275 S ACTIN
 L51 579 S L50 AND L1,L2
 L52 80 S L50 AND (MAGNESIUM OR MG) () CHLORIDE
 L53 237 S L50 AND MGCL2

L54 2524 S L50 AND MG###
 L55 2744 S L51-L54
 L56 70 S L55 AND ?CRYS?
 L57 1 S L56 AND SUSPENSION/TI
 L58 1405 S L50 AND MAGNESIUM
 L59 40 S L58 AND ?CRYS?
 L60 8 S L59 NOT L56
 L61 1 S L60 AND PREPARATION
 L62 7 S L50 AND (HARTMAN J? OR MALIK F? OR SAKOWICZ R? OR FINER J?)/A

FILE 'BIOSIS' ENTERED AT 17:02:27 ON 11 FEB 2002

FILE 'MEDLINE' ENTERED AT 17:02:46 ON 11 FEB 2002

L63 38076 S L9
 E ACTIN/CT
 E E3+ALL
 E E2+ALL
 L64 22430 S E11/CT,CN
 L65 38076 S L63,L64
 L66 774 S L65 AND L1,L2
 L67 2980 S L65 AND ((MAGNESIUM OR MG)())CHLORIDE OR MGCL2 OR MG### OR MAG
 L68 82 S L66,L67 AND ?CRYS?
 L69 1 S L68 AND DEPOLYMERIZATION/TI AND DIVALENT METAL CHLORIDE/TI
 L70 652 S (ACTINS(L)IP)/CT
 L71 112 S L70 AND L66,L67
 L72 88 S L64/MAJ AND L71
 L73 7 S L72 NOT AB/FA
 L74 81 S L72 NOT L73
 SEL DN 24 72
 L75 2 S E1-E4 AND L74
 L76 3 S L69,L75
 L77 3 S L63-L75 AND L76
 L78 1579 S L65 AND SARCOM?
 L79 72 S L78 AND L66,L67
 L80 1 S L79 AND L68
 L81 3 S L70 AND L79
 L82 4 S L80,L81
 L83 3 S L82 NOT SARCOMA
 L84 4 S L81,L83

FILE 'MEDLINE' ENTERED AT 17:18:51 ON 11 FEB 2002

FILE 'WPIX' ENTERED AT 17:18:58 ON 11 FEB 2002

L85 497 S ACTIN
 E MAGNESIUM CHLORIDE/DCN
 E E3+ALL
 L86 6218 S E2 OR 1801/DRN
 L87 236682 S MGCL2 OR (MG OR MAGNESIUM)()CHLORIDE OR MG### OR MAGNESIUM OR
 L88 34 S L85 AND L86,L87
 L89 0 S L88 AND ?CRYS?
 L90 1 S L88 AND SARCOM?
 E SARCOM
 L91 13 S E20-E26
 L92 4 S L91 AND L85
 L93 0 S (PARACRYS? OR PARA CRYST?) AND L85
 L94 4 S ?CRYS? AND L85